

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Joint Application of: Mishra, et al.
Serial No.: 09/580,519
Filing Date: May 25, 2000
Group Art Unit: 2141
Examiner: Adnan M. Mirza
Title: **ELEMENT MANAGEMENT SYSTEM WITH
DYNAMIC DATABASE UPDATES BASED ON
PARSED SNOOPING**

DECLARATION PURSUANT TO 37 C.F.R. § 1.131

I, the undersigned, hereby declare and state that:

1. I am over the age of 21 years, of sound mind, and competent in all respects to make this Declaration.
2. I am a joint-inventor of the subject matter of the above-referenced patent application, entitled *Element Management System with Dynamic Database Updates Based on Parsed Snooping*, filed on May 25, 2000 (the "Application").
3. The Examiner rejected Claims 1-11 (the "Claims") of the Application in an Office Action mailed September 27, 2004, based, at least in part, upon U.S. Patent No. 6,363,421, to Barker et al.
4. I developed an understanding and appreciation of the subject matter of the Claims prior to May 31, 1998. As an example, prior to May 31, 1998, I co-authored an approximately four hundred and seventy-eight page document, entitled "*FENICS 1.0 Functional Requirments Specification*" ("*FENICS FRS*"), which addresses aspects of the subject matter of the Claims. An excerpt from the *FENICS FRS* that includes pages 65-81, 123-128, 171-174, and 222-223 is attached hereto as Exhibit A. Furthermore, beginning prior to May 31, 1998, I worked diligently to reduce the subject matter of the Claims to practice, until the subject matter of the Claims was reduced to practice.

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5. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true. Further, I declare that these statements are made with the knowledge that willful false statements, and the like so made, are punishable by fine or imprisonment, or both, under Section 1001, Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the Application or any patent issuing thereon.

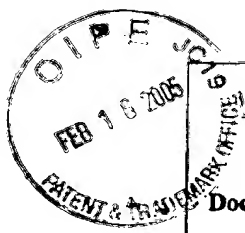
Signed this 6th day of ^{February} ~~January~~, 2005.



Gilbert Levesque



EXHIBIT A



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7.1.2.1.1.3 Use Case: sendRequest

"Use Case: sendRequest" on page 260

7.1.2.1.1.4 Use Case: NE_State_Machine

- Preconditions:** The NE must be defined. Inactive is the initial state of the FENICS representation of the NE device.
- Preconditions:** The state machine provides the preconditions for each state transition.
- Description:** The NE shall support the notion of a state machine. The state machine will depict the valid states and transitions for the NE. Each state transition will send an event to the **EventHandler**. The following state diagram captures the high level states and transitions.



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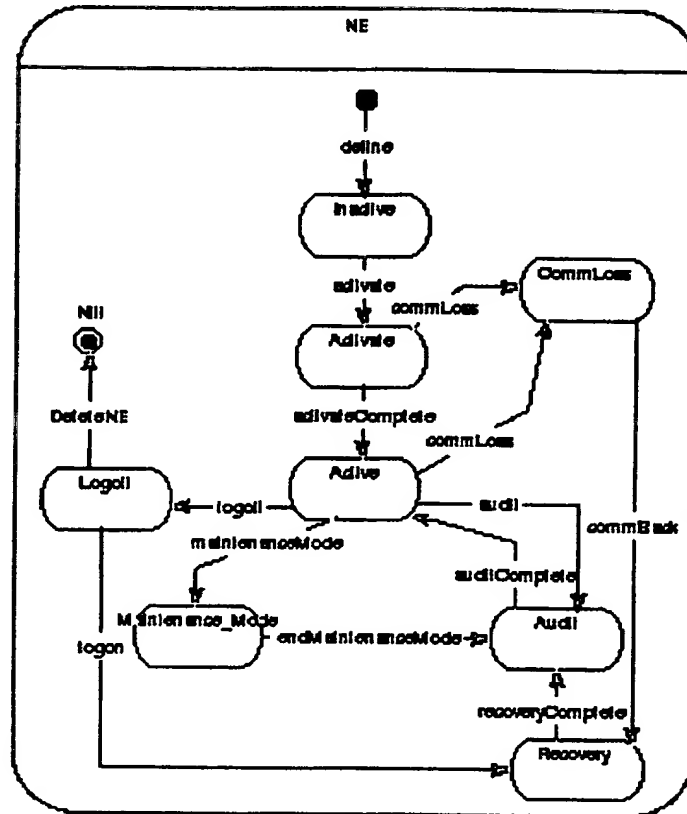
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There will be additional states and transitions, but they are deferred to the Analysis Phase:



Exception: There are numerous exceptions which can occur in this state machine, but they are deferred until the Analysis Phase.

Postconditions: The NE state machine stays in effect until the NE is removed from the system.

Scenarios for Use Case:

NE_State_Machine

Diagram: "OMTDiagram: NE_State_Machine" on page 67

Requirement ID: [CM-4.0], CM-6.0.2, [SM-1.5]

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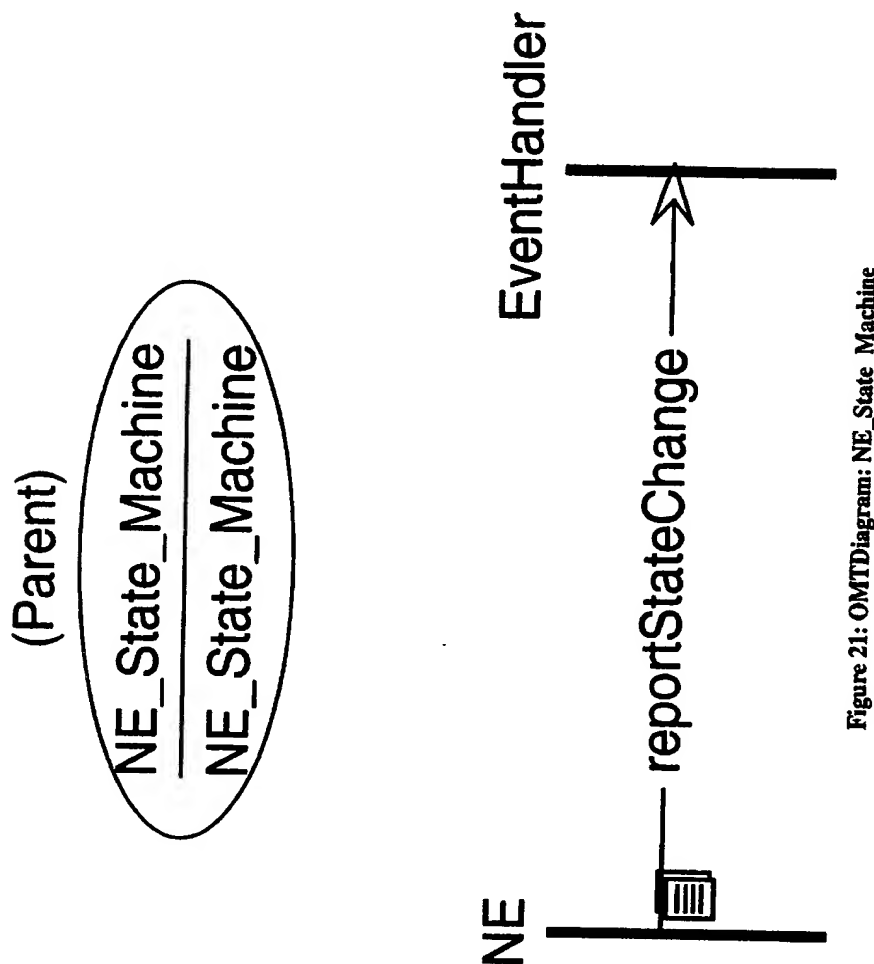


Figure 21: OMTDiagram: NE_State_Machine

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7.1.2.1.1.5 Use Case: SynchronizeNE

Preconditions:	Some part of the NEConfiguration requires synchronization.
Description:	<p>Synchronization will update some part of the NEConfiguration.</p> <p>Synchronization of the NEConfiguration will only affect the NE and/or the NE provisionable data.</p> <p>Synchronization will only include non-destructive operations (i.e. adds) unless manually override is requested by the User. No data will be lost or changed automatically by the FENICS system.</p>
Exception:	None identified at this time.
Postconditions:	This part of the NEConfiguration has been synchronized with the NE Device.

7.1.2.1.1.6 Context: CrossconnectReconciler

"Context: CrossconnectReconciler" on page 171

7.1.2.1.1.7 Use Case: AddNetworkElementConfigurationData

"Use Case: AddNetworkElementConfigurationData" on page 96

7.1.2.1.1.8 Use Case: createSession

"Use Case: createSession" on page 250

7.1.2.2 Context: NE_Audit

NE Audit is the means by which FENICS audits the NE Device with the FENICS representation of the NE device, the

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NE. For the purpose of this document, the process of auditing the data at the NE device with the data at FENICS is performed by the **Auditor**.

For background and terminology, familiarization with the concepts described during the NE Activation is recommended.

The **Auditor** is responsible for providing the following features:

- **Manual Audit** - initiated by the user. The user is provided with an **Audit_Strategy** which was defined as part of the **NEProfile**. The user may override this **Audit_Strategy**.
- **Automatic Audit** - initiated automatically by the system. An **Audit_Strategy** is provided in the **NEProfile**. When auditing the NE, the **Auditor** retrieves the NE device configuration data and compares it with the associated **NEConfiguration**. Depending upon the type of configuration data and the audit strategy, the Auditor determines whether a discrepancy exists and what action to take as a result. In addition, the Auditor will, depending upon the **Audit_Strategy**, initiate the reconciliation of all **CrossConnects** and **Faults**. See Figure 22: "NE Audit" on page 70.



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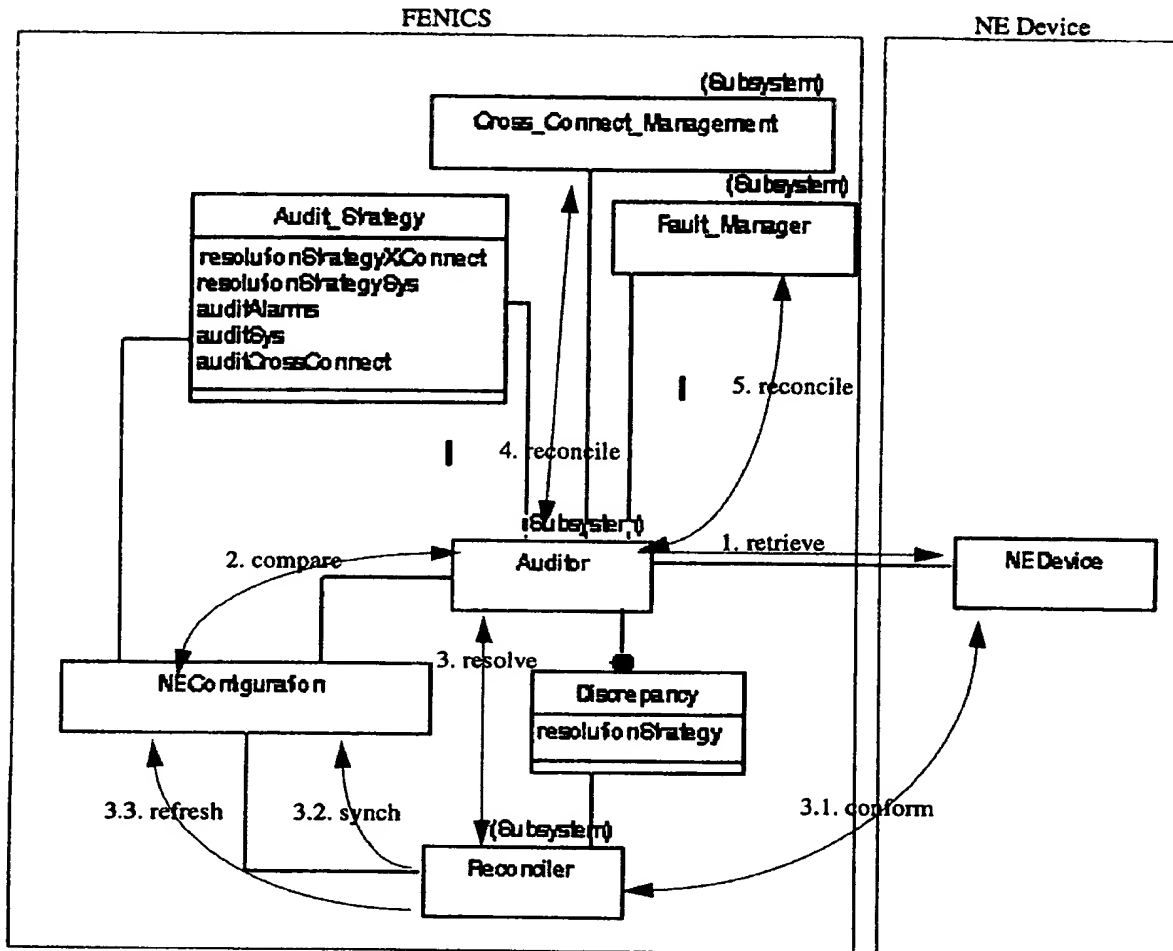
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Figure 22: NE Audit



The **Auditor** must be provided with an **Audit_Strategy**. A default **Audit_Strategy** is established during the definition of the **NEProfile**. The default **Audit_Strategy** is utilized by both the automatic and manual audit. Alternatively, the **User** may tailor the default **Audit_Strategy** for a manual audit. The **Audit_Strategy** provides the scope and resolution strategy which is used by the **Auditor**. In order to define the scope for an Audit, it requires the introduction of some additional generalizations for the **NEConfiguration**. The scope for an Audit can be based on the FENICS representation of the NE's system configuration, the **NESystemConfiguration**. That is, the NE and its related **NEData**. The **Equipment** and its related **EqptData**. The **Facility** and its related **FacilityData**. Figure 23: "NE System Configuration" on page 71 depicts the NE system configuration. In addition, the scope of an Audit can be based on the FENICS representation of the NE's cross-connects, the **CrossConnect** and related **CrossConnectData**.

To summarize, the **Audit_Strategy** provides the scope of the Audit. Scope is applicable to manual and automatic audits. The following scope is supported for an **Audit_Strategy**:

- System configuration (True | False) - **NESystemConfiguration**

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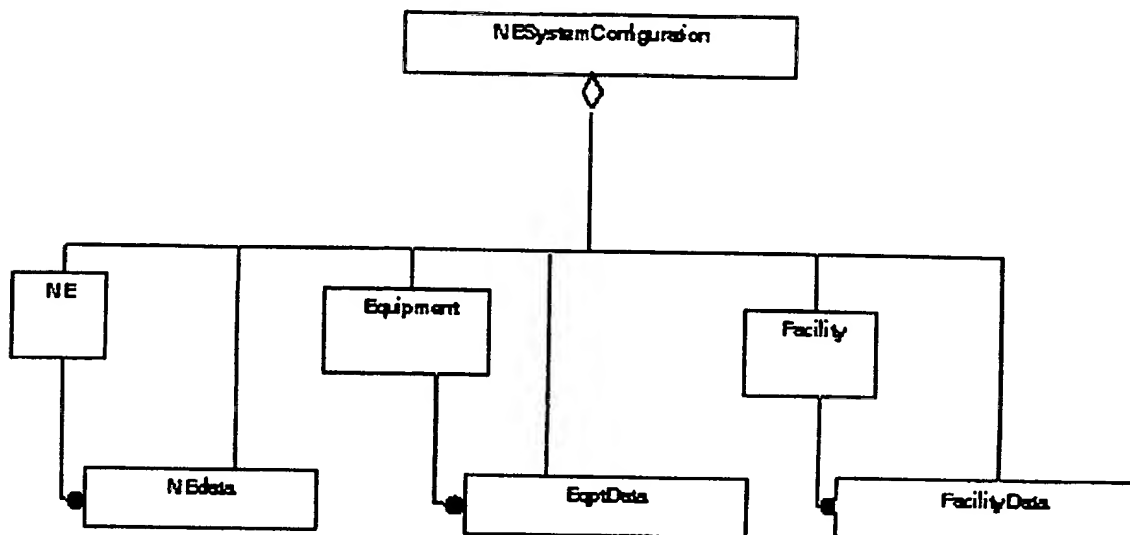
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- Cross-connect (True | False) - **CrossConnect** and **CrossConnectData**.
- Figure 23: NE System Configuration



The **Audit_Strategy** specifies the resolution strategy. That is, when a **Discrepancy** is discovered, what action should be taken by the **Auditor**. See Figure 24: "NE equipment discrepancy" on page 72 for an example of a **Discrepancy** between the **NEDevice** and the **NE**. The following summarizes the supported resolution strategies:

- **NEDevice** provides controlling view. The **Auditor** will forward any discrepancies to the **Reconciler** in order to synchronize the **NE**. The **Discrepancy** and the resolution are written to the log.
- **FENICS** provides controlling view. The **Auditor** will forward any discrepancies to the **Reconciler** in order to conform the **NE** device. For release 1 FENICS, this behavior is only provided for manual interactive audits. The **Discrepancy** and the resolution are written to the log.
- Report discrepancies. The **Auditor** will not reconcile the **Discrepancy**. The **Auditor** will provide a report of each **Discrepancy**. If the Audit was invoked manually by the user, the user may interactively choose to resolve one or more **Discrepancy** by selecting either FENICS, or the **NE** device, to have the controlling view. The user may then forward the **Discrepancy** with a resolution strategy to the **Reconciler**. Alternatively, for an automatic audit or a notification audit, the report only option will enter the **Discrepancy** into the log.

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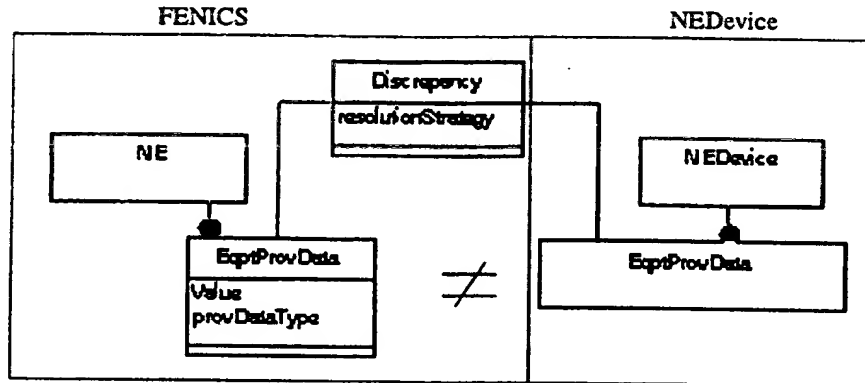
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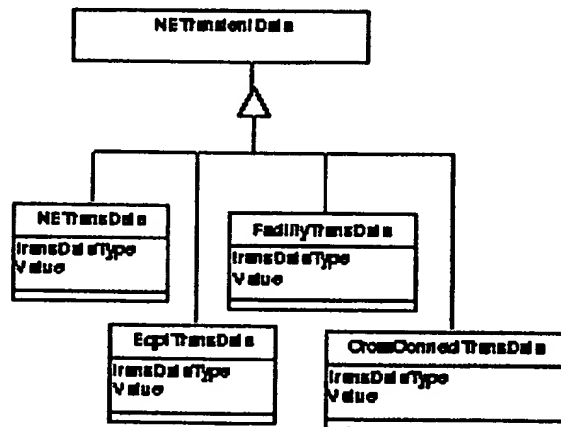
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Figure 24: NE equipment discrepancy



In summary, the **Audit_Strategy** provides a resolution strategy for the **NESystemConfiguration**, and the **CrossConnect**. Both the **NESystemConfiguration** and the **CrossConnect** contain transient data. The resolution strategy does not pertain to the transient data. That is, the NE device always maintains the controlling view for transient data and FENICS will simply reflect those values. See Figure 25: "NE Transient data" on page 72 for the FENICS representation of the transient data.

Figure 25: NE Transient data



When the **Auditor** discovers a **Discrepancy**, the **Auditor** will report the **Discrepancy**, or forward it to the **Reconciler** for resolution based on the resolution strategy. The NE transient data is always represented at FENICS, therefore, the **Auditor** always request the **Reconciler** update the **NETransientData**. For provisionable data, the resolution strategy may specify conforming the **NEDevice** to the **NE**, or synchronizing the **NE** to the **NEDevice**.

The **Auditor** will register with the **EventHandler** in order to receive **NEDevice** configuration changes. The **Auditor** will process these notifications using the **Audit_Strategy** defined in the **NEProfile** for the **NE**.

The **Auditor** will register with the **EventHandler** in order to receive changes in the state of the session with the **NEDevice**. If the session to an NE device is lost, the **NE** must transition to the **CommLoss** state. When session is re-established, the **Auditor** will send any un-applied **NEConfigurationData** to the **NEDevice**, and then audit the

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NEConfiguration as per the Audit_Strategy.

Refer to the following use cases for additional functionality on the NE Audit.



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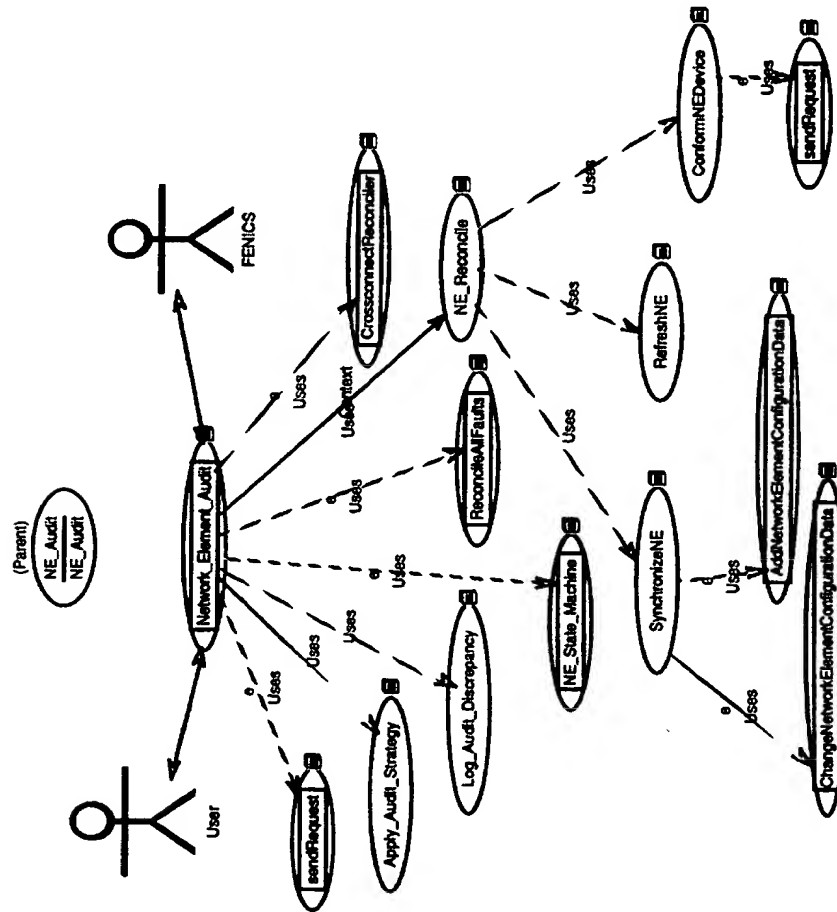


Figure 26: OMTDiagram: NE_Audit

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7.1.2.2.1 Use Case: Apply_Audit_Strategy

Preconditions:

A manual, automatic or notification audit has discovered a discrepancy.

Description:

Whenever the **Auditor** is comparing the NE device configuration with the NE configuration, the **Audit_Strategy** is utilized in order to determine scope and resolution strategy.

Table 13: Audit Strategy

Scope		Resolution Strategy			
		NE Device has controlling view **	NE has controlling view	Report discrepancies ***	Report discrepancies - interactive resolution *
NESystem-Configuration	provisionable data	1. Synchronize the NE (none destructive) 2. Log discrepancy resolution.	1. Conform the NEDevice (none destructive) 2. Log discrepancy	1. Report discrepancy	1. Report discrepancy 2. Synchronize the NE, Conform the NE device or do nothing.
	transient data	1. Refresh the NE	1. Refresh the NE	1. Refresh the NE	1. Refresh the NE
Cross_Connect	provisionable data	1. Synchronize the NE (none destructive) 2. Log discrepancy resolution.	1. Conform the NEDevice (none destructive) 2. Log discrepancy	1. Report discrepancy	1. Report discrepancy 2. Synchronize the NE, Conform the NE device or do nothing.
	transient data	1. Refresh the NE	1. Refresh the NE	1. Refresh the NE	1. Refresh the NE
* for manual audit only, default ** default for automatic audit *** for automatic and notifications report to the log, for manual report to user					

The notion of "none destructive" means that the FENICS system will not overwrite or delete any provisioned information. That is, the strategy of FENICS is that: information may be added, but not modified or deleted unless explicitly requested during a manual audit.

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Exception: None identified at this time.

Postconditions: None identified at this time.

Requirement ID: CM-5.0.1, CM-5.4.1

7.1.2.2.2 Use Case: ChangeNetworkElementConfigurationData

"Use Case: ChangeNetworkElementConfigurationData" on page 104

7.1.2.2.3 Use Case: Network_Element_Audit

Preconditions:

The NE state model permits the transition to Audit.

Description:

FENICS provides the ability to audit the NEConfiguration with the NE device configuration. This process is performed by an Auditor. The Auditor requires an Audit_Strategy. The Audit_Strategy provides the scope of the audit and the resolution strategy. Audits can be performed manually by the User, or automatically by the system.

If the audit is a manual audit, the User may override the Audit_Strategy, which was defined in the NEProfile. The User may also choose to resolve a Discrepancy interactively.

Automatic audits are a result of a user defined NEProfile attribute set during NE Definition. The automatic audit will occur as a result of certain state transitions. For example, after a lost session to the NE device is re-established. The Audit_Strategy for an automatic audit is provided by the NEProfile and was established during NE Definition.

The resolution of a Discrepancy involves the Reconciler. The Reconciler provides the Auditor with the ability to Refresh the NE, Synchronize the NE, or Conform the NE device. Refer to the Reconciler for more details.

The Auditor will maintain any NEConfiguration changes that have not been applied to the NEDevice.

The Auditor will utilize the Audit_Strategy and perform the following steps:

- If auditSystem is TRUE
 - Obtain the system level data from the NE device
 - Compare the NE device system level data to the NEData. For each Discrepancy, apply the resolution strategy
 - Obtain the equipment data from the NE device
 - For each piece of equipment, compare the NE device equipment data to the NE

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EqptData. For each **Discrepancy**, apply the resolution strategy.

- Obtain the facility data from the NE device.
- For each facility, compare the NE device facility data to the **NE FacilityData**. For each **Discrepancy**, apply the resolution strategy.
- If **auditCrossConnect** is **TRUE**
 - request the **CrossConnectManagement** to reconcile all **CrossConnect**.
- If **auditAlarms** is **TRUE**
 - request the **FaultReconciler** to reconcile all **Faults**.

Exception:

If any part of this process fails, the **Auditor** will log the error and transition the **NE** to an error state.

Postconditions:

The **NE** will transition to the **Active** state.

Actors: User, FENICS

Using Mandatory Use Cases:

NE_State_Machine

ReconcileAllFaults

NE_Reconcile

Log_Audit_Discrepancy

sendRequest

Apply_Audit_Strategy

CrossconnectReconciler

Used by:

End_Maintenance_Mode

Reactivation

Logon

Scenarios for Use Case:

Network_Element_Audit

Diagram: "OMTDiagram: Network_Element_Audit" on page 78

Requirement ID: CM-5.0.1, CM-5.4.1, CM-2.0.1, CM-5.1.1, CM-5.1.2, CM-5.1.3, FM-2.1.1



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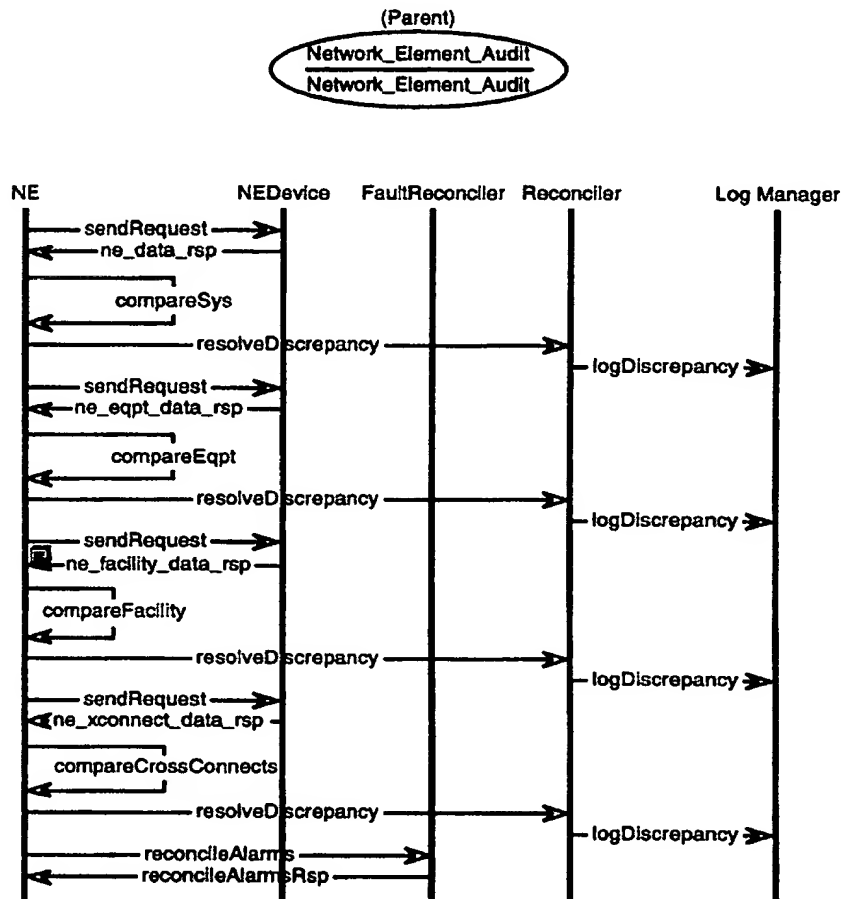


Figure 27: OMTDiagram: Network_Element_Audit

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7.1.2.2.4 Use Case: AddNetworkElementConfigurationData

"Use Case: AddNetworkElementConfigurationData" on page 96

7.1.2.2.5 Use Case: NE_State_Machine

"Use Case: NE_State_Machine" on page 65

Refer "Use Case: NE_State_Machine" on page 65"

7.1.2.2.6 Use Case: NE_Reconcile

Preconditions:

Some part of the NE configuration needs to be reconciled with the NE device.

Description:

Since FENICS maintains a representation of the NE device, the requirement to reconcile differences between the NE and the NEDevice is formalized. In order to reconcile the NE with the NEDevice, or the NEDevice with the NE, the following primitives are defined:

- Conform the NEDevice - applies some part of the NEConfigurationData to the NEDevice
- Synchronize the NE - utilizes some part of the NEDeviceConfigurationData to affect changes to the NE or to the provisionable NEConfigurationData.
- Refresh the NE - applies some NE device transient data to the associated NETransientData.

Exception:

None identified at this time.

Postconditions:

Some part of the NEConfiguration is reconciled with the NEDeviceConfiguration.

7.1.2.2.7 Use Case: ConformNEDevice

Preconditions:

A request for the NE device to conform to some part of the NEConfigurationData.



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Description: Conforming the NE device is the process of applying some part of the provisionable **NEConfigurationData** to the NE device.

Exception: none identified at this time.

Postconditions: The NE device will reflect the particular **NEConfigurationData**.

7.1.2.2.8 Use Case: Log_Audit_Discrepancy

Preconditions: A discrepancy was discovered by the Auditor.

Description: A discrepancy is a discovered difference between the NE device configuration and the NE configuration. When a discrepancy is discovered by the Auditor, the Auditor will record the discrepancy to the log in accordance with the audit strategy. Alternatively, when a discrepancy is discovered by the auditor, and the audit strategy was to resolve the discrepancy, the Auditor will forward the discrepancy to the Reconciler to perform the resolution. The Reconciler will record the discrepancy and the resolution in the log.

Exception: none identified at this time.

Postconditions: The discrepancy and any resolution is recorded in the log.

Requirement ID: CM-5.3.1

7.1.2.2.9 Use Case: RefreshNE

Preconditions: Some **NETransientData** requires updating.

Description: The Reconciler provides the ability to update **NETransientData**.

Exception: None identified at this time.

Postconditions: Some **NETransientData** is now up-to-date with the NE Device.

7.1.2.2.10 Use Case: SynchronizeNE

Preconditions: Some part of the **NEConfiguration** requires synchronization.

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Description: Synchronization will update some part of the NEConfiguration.
Synchronization of the NEConfiguration will only affect the NE and/or the NE provisionable data.
Synchronization will only include non-destructive operations (i.e. adds) unless manually override is requested by the User. No data will be lost or changed automatically by the FENICS system.

Exception: None identified at this time.

Postconditions: This part of the NEConfiguration has been synchronized with the NE Device.

7.1.2.2.11 Context: CrossconnectReconciler

"Context: CrossconnectReconciler" on page 171

7.1.2.2.12 Use Case: ReconcileAllFaults

"Use Case: ReconcileAllFaults" on page 63

Refer "Use Case: ReconcileAllFaults" on page 63"

7.1.2.2.13 Use Case: sendRequest

"Use Case: sendRequest" on page 260

7.1.2.3 Context: NE_Definition

NE Definition is the means by which the FENICS defines and manages its view of the network element and its configuration data [NEConfiguration]. It focuses on how the NE is introduced to FENICS, how NE configuration data is added to and deleted from FENICS, and how that data can be modified within FENICS. It is responsible for the integrity and consistency of the NE configuration data within FENICS.

FENICS has a notion of a 'bill of materials' for the configuration of any supported NE. This bill of materials captures the equipment hierarchy for an NE, allowing FENICS to determine what NE configuration data is valid. This bill of materials can capture dependencies between various components in the configuration data. The term component is used generically within this section to refer to any piece of equipment [Equipment] (e.g. interface card, chan-



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7.1.2.6.3 Use Case: NE_State_Machine

"Use Case: NE_State_Machine" on page 65

Refer "Use Case: NE_State_Machine" on page 65"

7.1.2.6.4 Use Case: Network_Element_Audit

Refer "Use Case: Network_Element_Audit" on page 76"

7.1.2.6.5 Use Case: maintainSession

"Use Case: maintainSession" on page 253

7.1.2.7 Context: NE_Notifications

The NE device can generate autonomous notifications which may affect the NEConfiguration. These notifications need to be assessed and processed by the Auditor.

The Auditor is responsible for keeping the NEConfiguration synchronized with the NEDevice. The Auditor will register with an EventHandler to receive notification about changes to the NE device configuration. When the Auditor receives a notification, it interprets the type of configuration data that has changed and utilizes the Audit_Strategy to determine the resolution strategy. An Audit_Strategy is defined for each NE in the NEProfile. The resolution strategy may be to log the change as a Discrepancy, or to reconcile the change with the NEConfiguration. Once the Auditor has determined the type of configuration data that has changed, and whether resolution is required, the Reconciler may be utilized to update the NEConfiguration.



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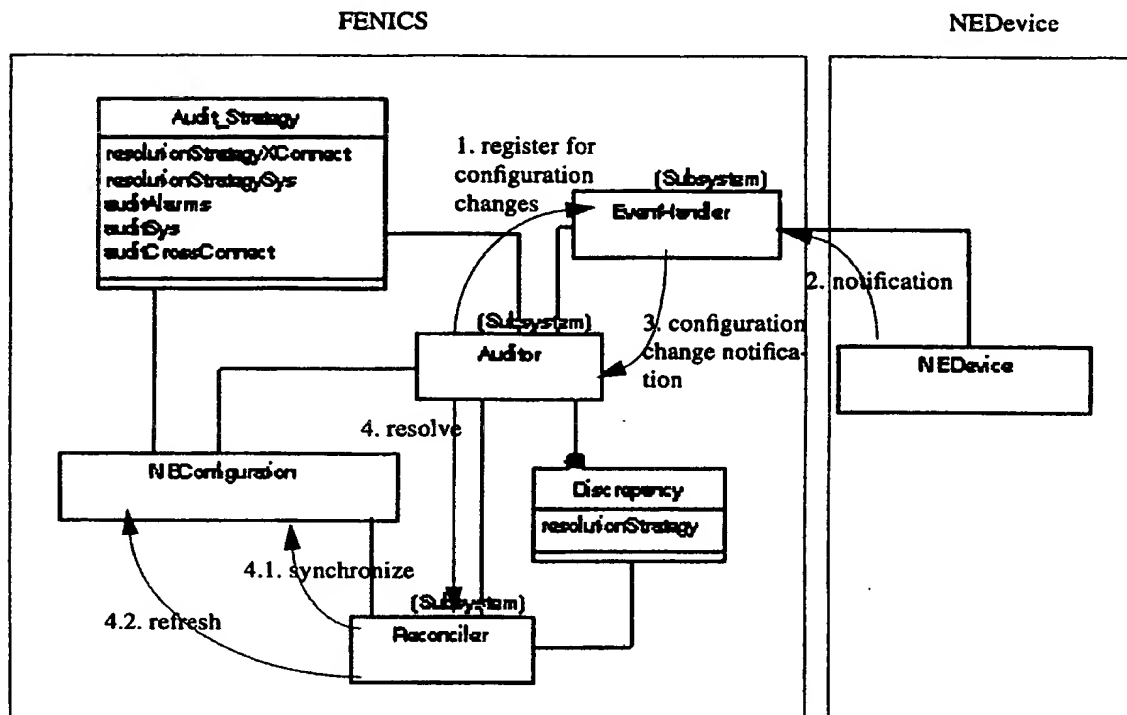
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Figure 44: NE Notifications



Refer to the following use cases for additional functionality on the NE Notifications.

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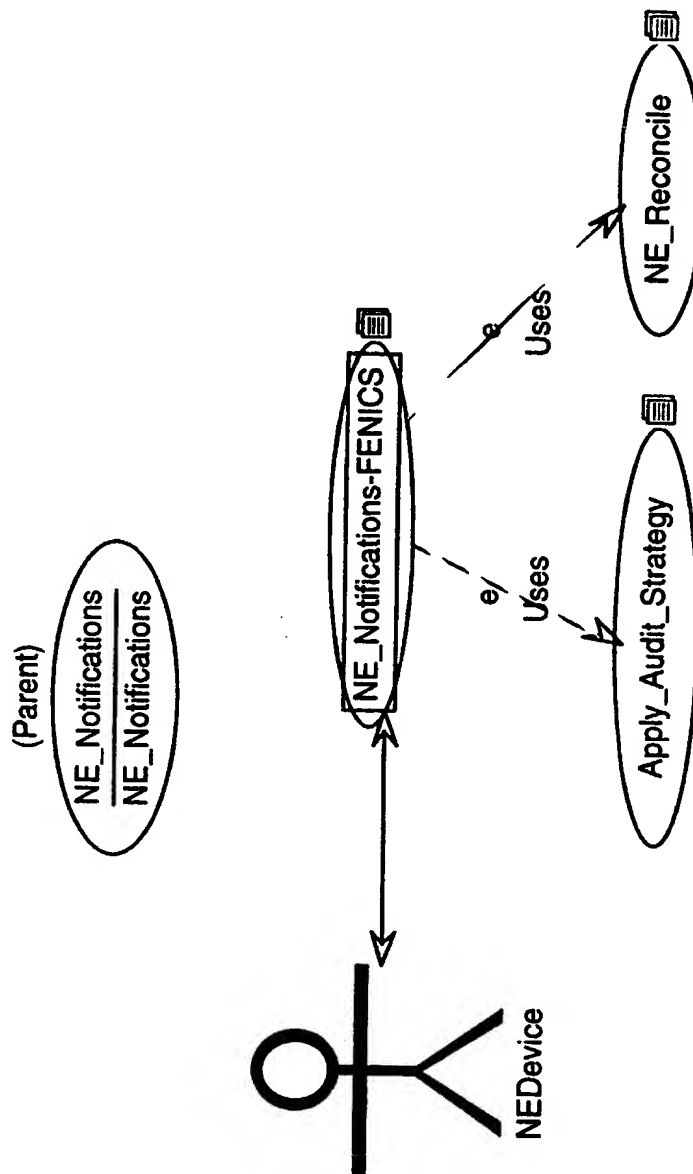


Figure 45: OMTDiagram: NE_Notifications

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7.1.2.7.1 Use Case: NE_Notifications-FENICS

Preconditions: The NE must be active.

Preconditions: The Auditor has registered with the **EventHandler** in order to receive notification of changes to the **NEDevice** configuration.

Description: Changes to the **NEDevice** configuration which are reported to the Auditor may effect the **NEConfiguration**.

The Auditor utilizes the **Audit_Strategy**, which was defined for the NE, to determine the resolution strategy for the type of data that has changed. If reconciliation is required, the **Reconciler** is utilized to reconcile the **NEConfiguration**

Exception: None identified at this time.

Postconditions: **Audit_Strategy** is utilized to carry out a resolution strategy (i.e. log discrepancy, refresh NE, or synchronize NE).

Actors: NEDevice

Using Mandatory Use Cases:

NE_Reconcile

Apply_Audit_Strategy

Using Optional Use Cases:

ReportAlarm

ReportEvent

ReportPM

ReportAutoLogoff

ReportDBChange

Scenarios for Use Case:

NE_Notifications-IEM

Diagram: "OMTDiagram: NE_Notifications-FENICS__1" on page 127

Requirement ID: CM-6.0.1, CM-6.1.1

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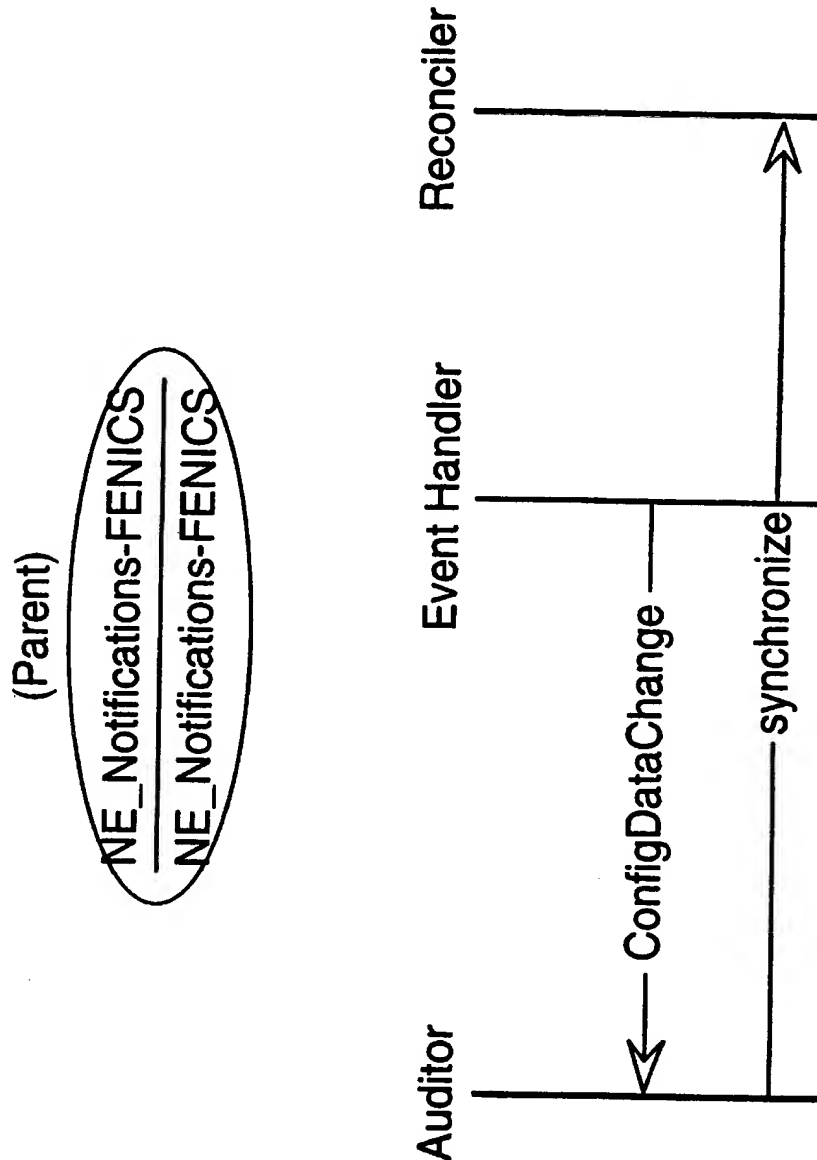


Figure 46: OMTDiagram: NE_Notifications-FENICS_1

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7.1.2.7.2 Use Case: Apply_Audit_Strategy

Refer "Use Case: Apply_Audit_Strategy" on page 75"

7.1.2.7.3 Use Case: NE_Reconcile

"Use Case: NE_Reconcile" on page 79

Refer "Use Case: NE_Reconcile" on page 79"

7.1.2.8 Context: Network_Topology

Network topology refers to the arrangement of nodes on a network in relation to one another. The network topology consists of network elements organized in subnetworks and interconnected by links. The subnetworks could reflect geographical partitions, but this is really up to a customer.

Partitioning the network into subnetworks also assists in the graphical display of the overall network. Typically a large network is too big to view in a single screen. Subnetworks give the user a high level of the network, that can be refined by selecting a subnetwork and drilling down to the next level.

There is always at least one subnetwork that exists in FENICS. This is the top level subnetwork. It is analogous to a "root directory" to which all subnetworks and/or NEs must belong. This top level subnetwork can never be deleted by a client and if the client adds an NE without specifying a subnetwork, then by default the NE is added to this top level subnetwork.

SubContext:

NE_Definition

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7.1.3.2.1 Context: CrossconnectReconciler

Crossconnect Reconciler is responsible for reconciliation of discrepancies between FENICS and NEDevice for all the crossconnects. The purpose of reconciliation is to synchronize the configuration/data between FENICS and NEDevice, or at least to report the discrepancies if any.

Crossconnect Reconciler can be invoked by [Activation] or [Network_Element_Audit]. When it is invoked by [Activation], all the crossconnects that exist in the NEDevice which is being activated will be retrieved and added to FENICS. When it is invoked by [Network_Element_Audit], a reconciliation is performed based on a user configured Audit Strategy.

Actors: Client

Used by:

Network_Element_Audit

Activation

Requirement ID: [SR-8.0.6]

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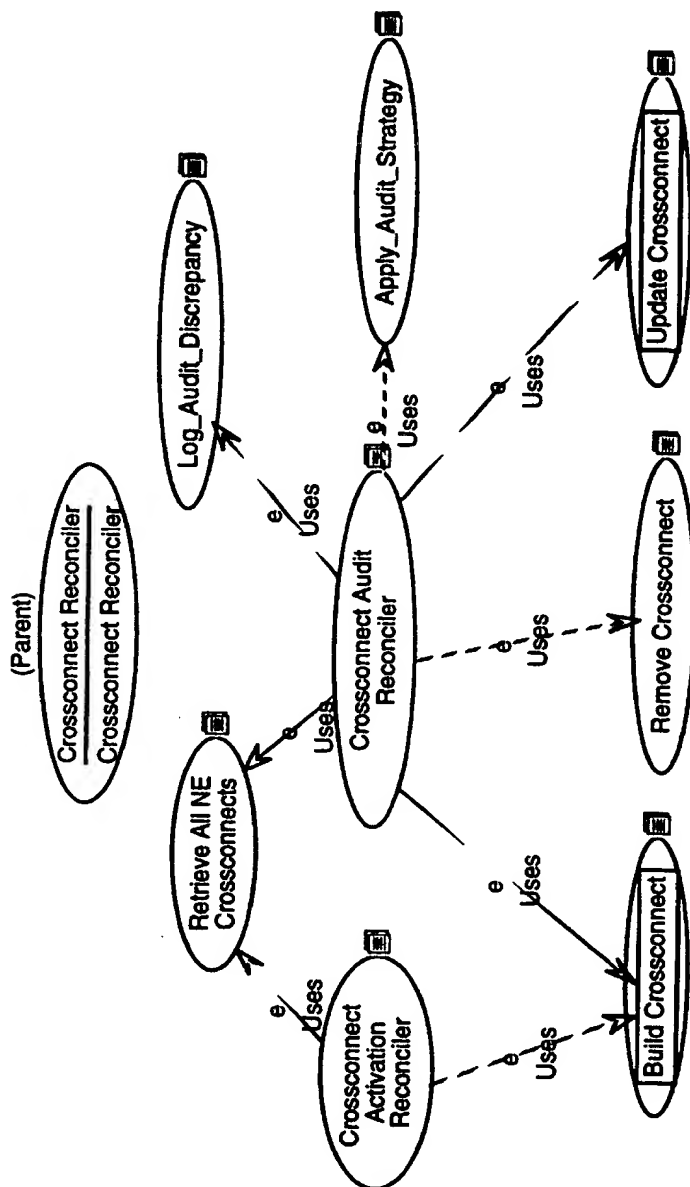


Figure S9: OMTDiagram: CrossconnectReconciler_1

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7.1.3.2.1.1 Use Case: Apply_Audit_Strategy

Refer "Use Case: Apply_Audit_Strategy" on page 75"

7.1.3.2.1.2 Use Case: BuildCrossconnect

"Use Case: BuildCrossconnect" on page 179

7.1.3.2.1.3 Use Case: CrossconnectActivationReconciler

Preconditions:	FENICS must have an active session with the NEDevice being activated.
Description:	FENICS will retrieve all the crossconnects [Retrieve All NE Crossconnects] from the NEDevice and add each individual crossconnect to FENICS [Build Crossconnect]. The beginning and finish time will be logged in FENICS and an event will be posted to the Event Handler once the operation is successfully completed. Any errors/exceptions encountered during the operation will also be logged in FENICS.
Exception:	The retrieval from NEDevice fails.
Exception:	The operation to add crossconnect to FENICS fails.
Exception:	The session/communication to the NEDevice is lost.
Exception:	Adding logs for the beginning and end of the operation fails.
Exception:	Emitting the event fails.
Postconditions:	All the crossconnects are synchronized between FENICS and NEDevice.

7.1.3.2.1.4 Use Case: CrossconnectAuditReconciler

Preconditions:	FENICS must have an active session with the NEDevice being activated.
Description:	FENICS will retrieve all the crossconnects [Retrieve All NE Crossconnects] from the



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	NEDevice and compare with all the crossconnects that exist in FENICS. The audit strategy will be applied for each discrepancy discovered [Apply_Audit_Strategy].
	The beginning and finish time will be logged in FENICS and an event will be posted to the Event Handler once the operation is successfully completed. Any errors/exceptions encountered during the operation will also be logged in FENICS.
Exception:	The retrieval from NEDevice fails.
Exception:	The operation (based on Audit strategy or user request) to add, remove, or update crossconnect to FENICS fails.
Exception:	The operation (based on Audit strategy or user request) to add, or update crossconnect to NEDevice fails.
Exception:	The session/communication to the NEDevice is lost.
Exception:	Adding logs for the beginning and end of the operation fails.
Exception:	Emitting the event fails.
Postconditions:	All the crossconnects are synchronized between FENICS and NEDevice or properly logged in FENICS.

7.1.3.2.1.5 Use Case: Log_Audit_Discrepancy

"Use Case: Log_Audit_Discrepancy" on page 80

Refer "Use Case: Log_Audit_Discrepancy" on page 80"

7.1.3.2.1.6 Use Case: RemoveCrossconnect

"Use Case: RemoveCrossconnect" on page 185

7.1.3.2.1.7 Use Case: RetrieveAllNECrossconnects

"Use Case: RetrieveAllNECrossconnects" on page 189

7.1.3.2.1.8 Use Case: UpdateCrossconnect

"Use Case: UpdateCrossconnect" on page 185

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7.1.4.1.5 Use Case: ReconcileAllFaults

Preconditions:	An active session exists for the NE.
Description:	The client can issue a request to reconcile all Faults associated with an NE. A log message is recorded with the LogManager to mark the start of the fault reconciliation. A list of active Faults is retrieved from the NEDevice via NESession [sendRequest]. The list of active Faults for the NE is retrieved from the ActiveFaultList. The two lists are compared, and each Fault is reconciled [Reconcile Fault]. Upon completion, a log message is recorded with the LogManager to mark the end of the fault reconciliation, and a Fault Reconcile Completion notification is posted to the EventHandler.
Exception:	Failure to retrieve fault list from the NEDevice.
Exception:	Failure to retrieve fault list for NE from ActiveFaultList.
Exception:	Reconcile Fault fails. The FaultReconciler will attempt to reconcile as many Faults as it can. A Fault Reconcile Partial Completion or Fault Reconcile Failure notification will be posted to the EventHandler.
Exception:	Logging either the start or finish message failed.
Exception:	Posting the Fault Reconcile Completion notification fails.
Postconditions:	The list of active faults in the NE matches the list at the NEDevice. A Fault Reconcile Completion notification has been posted. A start and finish message have been logged.

Actors: Client

Using Mandatory Use Cases:

sendRequest

ReconcileFault

Used by:

ReceiveAutonomousFaultMessage

IEM-NE_Reconciliation

Network_Element_Audit

Scenarios for Use Case:

Reconcile All Faults

Diagram: "OMTDiagram: Reconcile_Alarms" on page 64

Requirement ID: [FM-2.0], FM-2.1.3

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7.1.4.1.6 Use Case: ReconcileFault

Preconditions:

A Fault Reconciliation is in progress for an NE. A list of active **StandingFaults** has been retrieved for the **NEDevice** as well as the NE. The **StandingFault** is located in the respective lists as indicated in the table.

Description:

The **StandingFault** is reconciled as described in the table.

Table 16: Fault Reconciliation Scenarios

Fault Location		Scenario	Description	Exceptions
NE	NE Device			
yes	yes	none	no reconciliation required	none
no	yes	<i>StandingFault in NEDevice list only</i>	The FaultReconciler will issue a request to the FaultHandler to set the StandingFault on the NE. This will be accomplished by simulating the receipt of an autonomous fault message [<i>Receive Autonomous Fault Message</i>]. The discrepancy and its resolution will be issued to the LogManager .	<i>Receive Autonomous Fault Message</i> fails. Failure to log the discrepancy/resolution.
yes	no	<i>StandingFault in NE ActiveFaultList only</i>	The FaultReconciler will issue a request to the FaultHandler to clear the StandingFault on the NE. This will be accomplished by simulating the receipt of an autonomous fault message [<i>Receive Autonomous Fault Message</i>] to clear the StandingFault . <i>The discrepancy and its resolution will be issued to the LogManager.</i> There will be a fault duration based on when it was cleared by FENICS, but this will be apparent to the user (ie. user should know whether it was cleared by FENICS or the NEDevice).	<i>Receive Autonomous Fault Message</i> fails. Failure to log the discrepancy/resolution.
no	no	none	not applicable	none

Exception:

Scenario exceptions are described in the table.

Postconditions:

The **StandingFault** has been reconciled. If a discrepancy was found, the discrepancy/resolution has been logged.



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